

Message Text

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ORIGIN NEA-11

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FM SECSTATE WASHDC
TO AMEMBASSY TEHRAN
INFO HQ USAF WASHDC//KRCC/XOXXM/X001W/RDSD//
CARMISH MAAG TEHRAN
SECDEF/ISA/C31
HQ ESD HANSCOM AFB/OCTO/

C O N F I D E N T I A L STATE 124708

E.O. 11652: GDS

TAGS: IR

SUBJECT: GEODSS SITE SURVEY IRAN

REF: CARMISH MAAG TEHRAN IRAN/ARAF-C 291500Z APR 78

1. DOD HAS ADVISED US THAT NEXT WINDOW FOR POSSIBLE GEODSS SURVEY TEAM VISIT IS MAY 30-JUNE 7. WE UNDERSTAND AMBASSADOR MAY WANT TO CLEAR SUCH A SURVEY WITH SHAH. IN THAT CONNECTION AND IN REPLY TO REFTTEL, DOD HAS SUBMITTED REPORT BELOW. IT IS ALSO RELEVANT TO NOTE THAT OVERALL GEODSS BUDGET DECISIONS MUST BE MADE IN NEAR FUTURE IF PROJECT IS TO BE INCLUDED IN FY 80 BUDGET. IN LIGHT OF THIS INFORMATION, SHOULD GEODSS SURVEY TEAM PLAN TO COME
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TO IRAN DURING NEXT WINDOW?

2. AS FOR POSSIBLE COMBINED REVIEW WITH SHAH OF SEVERAL PENDING PROJECTS, RESULTS OF RECENT ARMY COMMUNICATIONS SURVEY WILL BE READY IN EARLY JUNE. ALSO WE EXPECT TO KNOW WITHIN FEW DAYS WHETHER DOD WILL REQUEST NSC DECISION ON MYSTIC STAR.

3. FOLLOWING IS DOD REPORT ON GEODSS:

(A) NIGHT SKY MEASUREMENTS WOULD BE MADE AT EACH POTENTIAL SITE LOCATION DURING TIMES THAT THE MOON IS BELOW THE HORIZON AND WEATHER FAVORABLE. PROCEDURE IS AS FOLLOWS:

(1) DURING DAYTIME SURVEY OF THE GENERAL AREA, A SPECIFIC LOCATION WILL BE CHOSEN FROM WHICH TO MAKE THE NIGHTTIME MEASUREMENTS. PREFERABLY, THIS SPECIFIC LOCATION SHOULD BE AS CLOSE TO DESIRED SITE AS POSSIBLE; AWAY FROM SOURCES OF ARTIFICIAL LIGHT; HAVE FEW HORIZON OBSTRUCTIONS SUCH AS BUILDINGS, TOWERS, MOUNTAINS, TREES; BE ACCESSIBLE TO THE VEHICLE BEING USED OR REQUIRE ONLY A SHORT WALK. A FLAT AREA, WITHOUT BUSHES OR LARGE ROCKS, ABOUT TEN BY TEN FEET IS CHOSEN.

(2) THE MEASUREMENT EQUIPMENT IS BROUGHT TO THE CHOSEN AREA AT SUNSET, PROVIDED THAT THE WEATHER APPEARS FAVORABLE (30 PERCENT CLOUDS OR LESS). EQUIPMENT LIST AND SEQUENCE OF SETUP IS AS FOLLOWS. A SMALL WOODEN TABLE IS SET AND LEVELED IN THE CENTER OF THE CLEARING. A TWELVE VOLT BATTERY AND AN OSCILLATOR/INVERTER ARE SET UNDER THE TABLE TO PROVIDE 120 VOLT 60 CYCLE AC POWER. A QUESTAR 3.5 INCH TELESCOPE IS SET ON ONE END OF THE TABLE AND ALIGNED TO TRUE NORTH. AT THE EYEPIECE END OF THE TELE-
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SCOPE IS ATTACHED A 3 BY 4 BY 5 INCH LIGHT TIGHT METAL BOX CONTAINING A PHOTOMULTIPLIER TUBE WHICH IS HANDCARRIED SEPARATELY FROM THE REST OF THE EQUIPMENT. AT THE OTHER END OF THE TABLE IS SET A HIGH VOLTAGE POWER SUPPLY WHICH CONVERTS THE 120 VOLT POWER TO THE HIGH VOLTAGE, LOW AMPERAGE, REQUIRED BY THE PHOTOMULTIPLIER TUBE. ALONGSIDE THIS IS PLACED A PICO-AMMETER WHICH MEASURES THE SMALL CURRENT PRODUCED BY THE PHOTOMULTIPLIER TUBE. THE ITEMS ARE CONNECTED BY COAXIAL CABLES, POWER IS APPLIED, AND THE DEVICE WARMED UP. MEANWHILE, THE VARIOUS RECORDING FORMS, STAR MAPS, AND CHECKLISTS ARE SET ON CLIPBOARDS AND READIED FOR USE. THE EQUIPMENT BOXES ARE USED AS SEATS. INCIDENTAL EQUIPMENT CONSISTS OF A LEVEL, SMALL FLASHLIGHTS, POCKET WATCH SET TO ZULU TIME, AND A SMALL TOOL KIT FOR EMERGENCY REPAIRS.

(3) AFTER THE SKY IS TOTALLY DARK, AND A FEW PRE-OPERATION-AL CHECKS ARE CONDUCTED, THE MEASUREMENTS ARE MADE. FIRST, TEN STARS ARE CHOSEN FOR CALIBRATING THE INSTRUMENT AND TO DETERMINE ATMOSPHERIC EXTINCTION. THESE STARS ARE CHOSEN FROM A LIST OF ABOUT SIXTY STARS OF KNOWN BRIGHTNESS WITH A SPECTRUM (COLOR AND TEMPERATURE) SIMILAR TO THE SUN. STARS ARE CHOSEN SO THAT THEY COVER A VARIETY OF ELEVATIONS ABOVE THE HORIZON. EACH STAR IS MEASURED IN TURN AS FOLLOWS: THE TELESCOPE IS POINTED TOWARDS THE STAR AND CENTERED IN THE FIELD OF VIEW. THE PHOTOCURRENT PRODUCED BY THE AMOUNT OF LIGHT RECEIVED IS MEASURED ON THE PICO-

AMMETER AND HAND RECORDED ON A FORM. A BLANK AREA OF THE SKY NEAR THE STAR IS MEASURED FOR BACKGROUND BRIGHTNESS. THEN THE LIGHT PATH IS BLOCKED TO MEASURE INSTRUMENT NOISE. THE TIME OF OBSERVATION IS RECORDED. THEN THE TELESCOPE IS REPOSITIONED TO THE NEXT STAR UNTIL TEN CALIBRATION STARS HAVE BEEN MEASURED. THESE MEASUREMENTS, PROPERLY REDUCED LATER, PROVIDE INFORMATION ON THE RESPONSE/PERFORMANCE OF THE EQUIPMENT AND PROVIDES A MEASUREMENT OF HOW MUCH POLLUTION/SMOKE/HAZE/DUST/ETC. CONFIDENTIAL

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IS PRESENT IN THE ATMOSPHERE. (STARS AT LOW ELEVATIONS WILL APPEAR FAINTER THAN THEIR THEORETICAL VALUE, AS SOME OF THEIR LIGHT ENERGY WILL BE ABSORBED BY PARTICLES IN THE ATMOSPHERE.)

(4) THE TELESCOPE IS THEN SET AT TWENTY DEGREES ELEVATION ABOVE THE HORIZON. AT EACH FIFTEEN DEGREES OF AZIMUTH A MEASUREMENT OF BACKGROUND SKY BRIGHTNESS IS MADE, AVOIDING ANY BRIGHT STARS IN THE TELESCOPE FIELD OF VIEW. THIS SERIES OF MEASUREMENTS IS PLOTTED LATER AND IDENTIFIES AREAS OF SKY GLOW FROM CITIES OR OTHER SOURCES OF ARTIFICIAL LIGHT WHICH WOULD INTERFERE WITH OPTICAL OBSERVATIONS. A SINGLE MEASUREMENT OF SKY BRIGHTNESS OF THE ZENITH IS ALSO MADE. THE OVERALL BRIGHTNESS OF THE NIGHT SKY IS DETERMINED LATER FROM THIS SET OF MEASUREMENTS AND IS COMPARED TO OTHER SITES SO THAT THE DARKEST, MOST POLLUTION FREE SITE CAN BE IDENTIFIED. NO GROUND OBJECTS ARE VIEWED DURING THIS PROCESS.

(5) POWER IS THEN TURNED OFF, THE EQUIPMENT DISMANTLED AND PACKED. UNDER PROPER CONDITIONS THE ENTIRE TIME FROM SETUP TO TEAR-DOWN IS ABOUT FOUR HOURS, ONLY TWO TEAM MEMBERS ARE REQUIRED TO MAKE THE MEASUREMENTS BUT IT IS HELPFUL TO HAVE A THIRD PERSON AS A DRIVER/ESCORT/OBSERVER.

(6) DATA REDUCTION IS DONE LATER. IN MOST CASES, A QUICK LOOK ESTIMATE OF SKY BRIGHTNESS CAN BE MADE BY THE FOLLOWING AFTERNOON. QUICK LOOK DATA REDUCTION IS DONE USING A HAND HELD CALCULATOR AND A SERIES OF GRAPHS, BUT MORE SOPHISTICATED MEANS ARE AVAILABLE AFTER THE TEAM RETURNS TO THE CONUS.

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B) IF NIGHT TIME MEASUREMENTS CANNOT BE MADE DUE TO CLOUDS OR EQUIPMENT FAILURE, A ROUGH ESTIMATE IS MADE VISUALLY BY THE OPERATOR. THIS ROUGH ESTIMATE IS BASED UPON EXPERIENCE AND THE VISUAL APPEARANCE OF CERTAIN SKY

OBJECTS, AND MUST BE FOLLOWED UP BY ACCURATE MEASUREMENTS AT A LATER DATE UNLESS THE SITE IS ELIMINATED FROM CONSIDERATION.

C) IN CASES WHERE THE SPECIFIC LOCATION IS LIMITED IN SIZE, AND IS THE ONLY REAL ESTATE AVAILABLE, AND SIGNIFICANT HORIZON OBSTRUCTIONS EXIST, THE HORIZON ELEVATION IS MEASURED ALSO. THIS IS DONE BY LEVELING THE TELESCOPE, SWEEPING IN AZIMUTH, AND RECORDING THE ELEVATION ANGLE OF ANY OBSTRUCTION OBSERVED. THIS DOES NOT REQUIRE USE OF THE PHOTOMULTIPLIER TUBE NOR THE ELECTRONICS, NOR DOES IT RESULT IN ANY PHOTOGRAPHIC RECORD.

D) FOR EACH LOCATION SELECTED FOR MEASUREMENT, IT IS PREFERABLE (BUT NOT MANDATORY) TO PHOTOGRAPH THE SITE. A 35MM SINGLE LENS REFLEX CAMERA (NIKON OR MIRANDA) WITH A 50 OR 55MM FOCAL LENGTH LENS IS SET ON A TRIPOD AT ABOUT EYE LEVEL, AND A SERIES OF TWELVE PHOTOGRAPHS IS TAKEN COVERING 360 DEGREES OF AZIMUTH, CENTERED HORIZONTALLY. COLOR PRINT FILM IS USED AND THE RESULTING PRINTS ARE JOINED TO FORM A 360 DEGREE PANORAMA. THESE ARE USED PRIMARILY FOR INFORMATION PURPOSES BUT DO HAVE SOME TECHNICAL VALUE IN IDENTIFYING MOVABLE OBSTRUCTIONS (SUCH AS LIGHT POLES) WHICH MUST BE CONSIDERED IN SITE ADAPTATION. BECAUSE POTENTIAL SITE LOCATIONS ARE CHOSEN SO THAT THEY ARE AWAY FROM SOURCES OF ARTIFICIAL LIGHT. IT IS UNUSUAL FOR THESE PANORAMAS TO SHOW LARGE COMPLEXES OF BUILDINGS, CITIES, RUNWAYS, LIGHTED TOWERS, ETC. SUCH ARTIFACTS CAN BE AVOIDED.

E) TO ASSIST IN SITE ADAPTATION, IT IS ALSO DESIRABLE TO PHOTOGRAPH THE SITE FROM A DISTANCE. PURPOSE HERE IS TO CONFIDENTIAL

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IDENTIFY SUITABLE ACCESS ROADS, AREAS TO BE GRADED, TYPE OF TERRAIN INVOLVED, VEGETATION, DRAINAGE PATTERNS, ETC. THESE PHOTOGRAPHS ARE USED IN CONJUNCTION WITH DETAILED MAPS IF AVAILABLE. ARTIFICIAL STRUCTURES THAT DO NOT HAVE ANY CONNECTION WITH THE CONSTRUCTION OR OPERATION OF THE SITE CAN BE OMITTED FROM SUCH PHOTOGRAPHS. A VARIETY OF FILMS WOULD BE USED (COLOR SLIDES AND BLACK AND WHITE PRINTS NORMALLY) IN 35MM CAMERAS. THE USE OF TELEPHOTO LENSES IS NOT NECESSARY, AND SUCH LENSES ARE NOT BROUGHT WITH THE TEAM.

F) IT IS SOMETIMES ADVISABLE TO PHOTOGRAPH POTENTIAL SUPPORT FACILITIES SUCH AS ACCESS ROADS, BRIDGES, SEWAGE PLANTS, COMMERCIAL POWER SUPPLY, LOCAL HOUSING, ETC., THAT WOULD HAVE AN IMPACT ON SITE SUITABILITY. SUCH PHOTOGRAPHS CAN BE TAKEN UNDER CONTROLLED CONDITIONS AND ARE USEFUL, BUT NOT MANDATORY, TO HELP DOCUMENT TEAM FINDINGS.

G) ALL EQUIPMENT, FORMS, CAMERAS, FILMS, ETC., USED BY THE TEAM ARE RETURNED TO THE CONUS FOR PROCESSING AND FINAL DATA REDUCTION. THE RESULTS OF THE MEASUREMENTS ARE PUBLISHED IN THE SITE SURVEY REPORT. THE SKY BRIGHTNESS MEASUREMENTS/RESULTS CAN BE PROVIDED TO HOST NATION ASTRONOMERS, ENGINEERS, ETC., IF SO DESIRED. COPIES OF ALL PHOTOGRAPHS TAKEN CAN BE PROVIDED TO LOCAL AUTHORITIES, PRIOR TO PUBLICATION OF ANY PHOTOGRAPHS IN THE SURVEY REPORT, IF SO DESIRED.

H) THE CIVIL ENGINEERING PORTION OF THE SURVEY WILL INCLUDE THE FOLLOWING DETAILS. PHOTOS MAY BE DESIRED FOR SOME ITEMS.

(1) TERRAIN: GEOGRAPHICAL COORDINATES, REAL ESTATE, CONFIDENTIAL

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ACCESS TO STORM DRAINAGE, SOILS DATA. (PHOTOS PROBABLE)

(2) UTILITIES: ELECTRIC POWER AVAILABILITY (COMMERCIAL OR SITE GENERATED), FUEL SUPPLY AND ACCESSABILITY, WATER SUPPLY, SEWAGE DISPOSAL. (PHOTOS PROBABLE)

(3) WEATHER DATA: GENERAL CONDITIONS AND UNUSUAL PHENOMENA (TO SIZE AIR CONDITIONING EQUIPMENT AND DETERMINE NEED FOR SPECIAL ENVIRONMENTAL PROTECTION).

(4) CONSTRUCTION CONDITIONS: PERCENTAGE OF EACH MONTH WHICH CAN BE USED FOR CONSTRUCTION, MATERIALS AND LABOR AVAILABILITY, AND DESIGN RESPONSIBILITY (I.E., CORPS OF ENGINEERS).

(5) ENVIRONMENTAL: POPULATION DATA NECESSARY FOR LOCATION SUPPORT FACILITIES FOR HOUSING AND FEEDING OF PERSONNEL ASSIGNED, SECURITY PROBLEMS EXISTING IN THE AREA, LOCAL LEGAL CONSIDERATIONS, ANIMAL LIFE WHICH MAY REQUIRE SPECIAL MEASURES SUCH AS FENCES, AND LOCAL LIVING COSTS.

(6) TRANSPORTATION AVAILABILITY.

(7) STORAGE AND MATERIAL HANDLING CAPABILITY.

(8) ADMINISTRATION: MILITARY SUPPORT UNITS EITHER U.S. AND/OR HOST NATION. IF ON BASE HOUSING/FACILITIES COULD BE MADE AVAILABLE TO PERSONNEL ASSIGNED, PHOTOS WOULD BE DESIRED. VANCE

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